

1. Executive Summary

1.1 Overview

Initially launched in Portugal in late 1995, prepaid cellular services have gradually been introduced to markets around the world. In many nations, prepaid cellular has transformed the wireless service arena stimulating massive subscriber growth, rising operator revenue, and increasingly widespread wireless usage.

However, prepaid cellular is much more than a strategy to increase total subscribers. In many ways, it is an entirely new manner of providing cellular services and its introduction carries somewhat “revolutionary” implications for operators who are aggressive in pursuing service implementation. Prepaid cellular directly impacts both the revenue and cost side of wireless operations and begins the transformation of cellular from a service to a product.

In this study, The Strategis Group examines prepaid cellular in light of demand and supply considerations, outlines the necessary steps to implementation, and provides a detailed analysis of three different prepaid cellular operator strategies. While the case studies and the analysis refer specifically to Latin American markets, the lessons outlined are relevant to markets across the globe.

In *Pre-Paid Cellular/PCS in Latin America: Market Potential and Business Strategies*, the Strategis Group analyzes 21 cellular markets in Latin America and the Caribbean, 16 of which offer pre-paid service. The analysis refers to operators within these 16 markets as well as to the three operators profiled in detail in the later chapters. Prepaid and contract subscriber and revenue forecasts are included in the appendix for reference.¹

1.2 Introduction

1.2.1 Definition

The name pre-paid cellular is fairly self-explanatory, it is cellular service that the user pays for in advance. Pre-paid cellular differs from traditional cellular service in that it does not require a contract between the user and operator and does not involve recurring monthly fees. The important concept of pre-paid cellular service is that the customer purchases minutes of use in advance and does not have any ongoing financial commitment to the operator.

Some operators call certain pay in advance plans ‘pre-paid’, even though they might involve a contractual monthly fee. In this study, The Strategis Group defines pre-paid cellular as a service that does not involve a monthly fee, even if the fee can be paid in advance. As we will explore throughout

1. A more detailed discussion and analysis of the overall Latin American wireless market is available in The Strategis Group’s recently published *Latin American Cellular Markets: 1999*.

this study, pre-paid cellular appeals to a segment of the market that is unable or unwilling to contract to pay a recurring monthly fee. For our purposes, pre-paid cellular exhibits the following characteristics:

- No service contract of any length
- No recurring fees other than related to usage
- Minutes of use are purchased in advance

For users, motivations to use pre-paid include the lower total cost for low usage customers, increased ability to directly control spending, simplified operator relationship, and the ability to receive service by the credit challenged.

1.2.2 Implementation

- Pre-paid cellular is implemented in one of three manners, including using a:
 - Pre-paid debit account established with the operator
 - Disposable or replenishable pre-paid card
 - Pre-paid debit phone.

The debit account or the card solution are implemented at the operator end of the business. Central office equipment and software enables the authorization and debiting of the account or card being used. The debit phone is primarily used by resellers as a method for implementing pre-paid service for capacity that they have purchased in bulk. With the debit phone, all authorization and account information is confined to the handset and the user must recharge the handset in order to continue use once the balance has been depleted.

The debit account and the pre-paid cards use standard cellular handsets that are identical to handsets used with contract plans. Since the modification is at the central office, any phone is capable of being used for these types of pre-paid (the one exception is phones in which the pre-paid card is inserted rather than having the information manually entered like a long-distance calling card). Debit phones require special handsets capable of tracking and retaining account balance information.

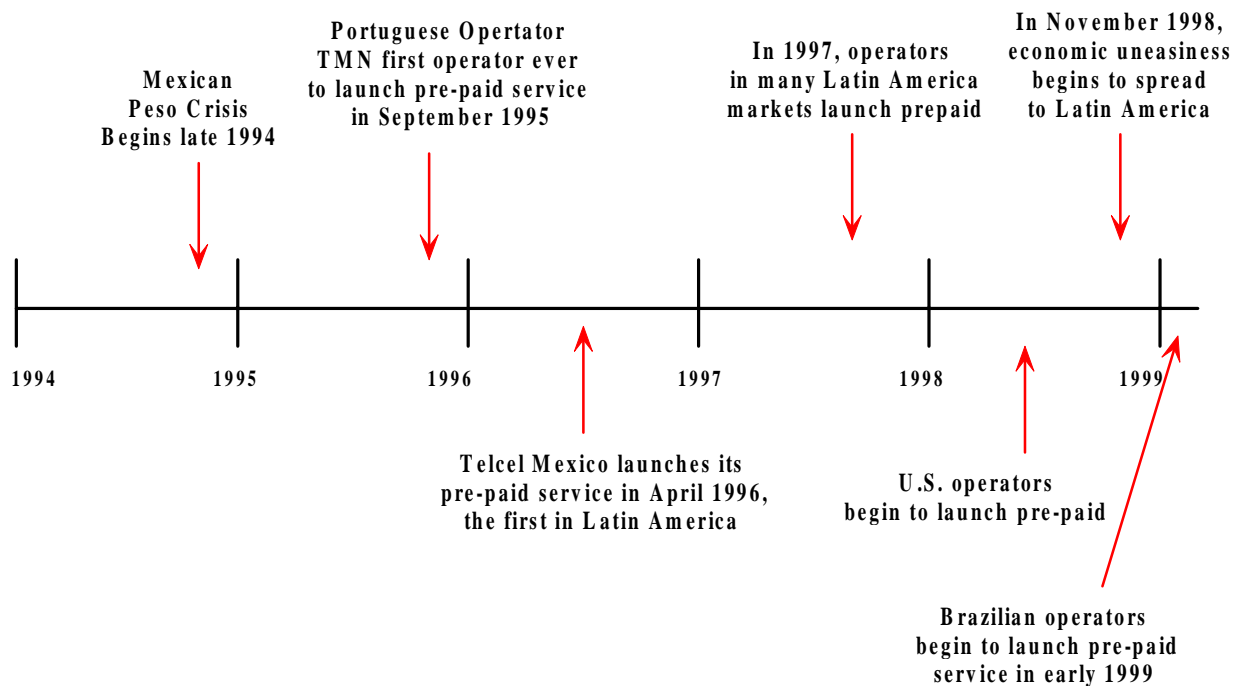
Pre-paid cellular kits are the preferred ‘shop and go’ method for users to begin their subscription. These kits include a handset and a pre-activated card ready for use directly out of the box. Because these kits are completely self-contained, they can be sold at any number of retail locations, dramatically expanding the distribution options for cellular service. With kits, the choice of a handset is limited, but subscribers can opt for a handset not in kits and pay the activation charge. Pre-paid can involve a one time activation fee, but this fee is often hidden to the cellular subscriber in the price of the pre-paid kits or the operator may choose to waive this expense as an incentive to the subscriber.

1.2.3 Historical Framework

Pre-paid cellular was introduced by Telecom Portugal’s cellular operator TMN (Telecomunicacoes Moveis Nacionais) in September 1995. Since that time, more than 32 European operators have launched pre-paid cellular services. Out of 97.8 million subscribers in Europe, over 30 million are pre-paid customers. In countries like Italy and Portugal, over 80% percent of new customers choose pre-paid.

Pre-paid cellular is available by more than 60 operators in the United States, but it has not had a significant impact on the market. Through the end of 1998, pre-paid cellular in the US had just over 2.5 million subscribers out of 66.9 million total US cellular/PCS subscribers (4% of the total subscriber base). There are several key reasons for the lack of adoption in the US market, including the relatively high penetration of contract services, easy access to consumer credit, highly subsidized handsets that make the cost of pre-paid service initiation seem high, and rapidly declining costs of cellular/PCS service fees in light of expanded competition (4 competitors in most major markets). This number is expected to grow, however, as operators increase marketing of pre-paid cellular.

Exhibit 1 Timeline of Pre-Paid Cellular Evolution



In 1996, Telcel (Mexico) became the first operator in the region to launch pre-paid service. Telcel Mexico's launch of pre-paid service coincided with the peso crisis of 1994, when the operator faced innumerable broken cellular telephone contracts as a result of the severe economic turbulence. The operator implemented pre-paid cellular service as an option for those cellular telephone owners who were not willing to sign a fixed contract again, yet already had a cellular telephone in their possession. A similar crisis struck Brazil in September 1998, and operators began to introduce pre-paid programs in early to mid 1999.

With the licensing of 1800/1900 MHz PCS operators in many markets in Latin America and future plans to license in the remaining markets, full competition (more than two operators in each region) will take place in the near future. With increased competition, operators need creative pricing plans to address the large potential subscriber base that is not currently served by cellular/PCS service. Operators are finding that pre-paid is one of most beneficial types of service plans to increase total market demand.

1.3 Latin America Telecommunications Environment

Latin America has experienced a rebirth in the past few years as economies open up their markets and deregulate industries. At the forefront of this has been the telecommunications industry. Over the past few years, telecommunications service quality has improved significantly in most markets and competition exists in both fixed lines services and cellular/PCS in many areas.

1.3.1 Public Telecommunications Operator Privatization

Nearly all regulators in Latin America have made privatization the prelude to opening markets to competition. The effort to privatize telecommunications in Latin America initiated a decade ago in Chile, culminated in 1998 with the sale of Brazil's PTO Telebrás, the largest telecommunications privatization ever held. El Salvador and Guatemala completed the long awaited privatization/capitalization during 1998 as well, breaking the logjam of activity in Central America. Several significant privatization transactions remain, however, including the privatization/capitalization of publicly owned operators in Bolivia, Colombia, Ecuador, Honduras, Costa Rica and Nicaragua.

1.3.2 Telecommunications Market Liberalization Trends

With the bulk of the privatization complete, combined with international agreements on trade in services, markets in the region are moving to permit competition in telecommunication services. Significant milestones in the trend towards competition in telecommunications regionally occurred during 1998 including:

Argentina -- Presidential Decree 264/98 issued during March 1998 outlines deregulation for local telephone and national and international long distance services. As of November 1999, two consortia will be allowed to bid for two local service concessions in addition to those of Telefónica and Telecom.

Brazil -- Law 9472/97 ended the Telebrás monopoly on services and called for the licensing of competitive operators following the sale of the government owned properties. Licensing of local and long distance "mirror" companies was partially completed as of January 1999.

Mexico -- During 1998, Cofotel licensed WLL spectrum to four entities and in 12/98 Cofotel made important ruling on network interconnection to facilitate growth in competition.

In Brazil, privatization also included mirror licensing, which will compete with the recently privatized incumbents. For example, Tele Norte Leste will compete with Canbra Telefonica, Embratel with MCI Worldcom, and Telesp Participações with Megatel do Brasil. Tele Centro Sul's bid for a competitor has not yet been completed.

1.3.3 Cellular Services

Changes in the regulatory environment have been a driving force behind the development of cellular services in Latin America. Developments in both privatization and liberalization have changed the competitive environment in which cellular operates and are important in understanding and projecting demand for cellular services in Latin America.

Competition in Chile began immediately after the first license was awarded in 1989, followed by Mexico in 1990 and Argentina in 1993. Competition only recently began in Brazil, however, and subscriber growth in Brazil is expected to drive growth for the entire region. The Strategis Group expects cellular/PCS services to grow from about 20 million at the end of 1998 to nearly 80 million in 2005.

The introduction of competition in local and long-distance telephone service provides new opportunities for wireless carriers. In particular, the regulatory regimes and pricing associated with interconnection are changing in order to accommodate new carriers. In general, there is a trend toward cost-based interconnection and the unbundling of network service elements, which generally results in lower interconnection prices to carriers. Furthermore, the costs for long-distance backhaul links, which are often used in cellular networks, will decline as the long-distance market becomes more competitive. These factors imply that cellular/PCS operators will have lower cost structures in markets with more competition in the landline telecommunications market. As such, wireless operators can afford to reduce prices to reflect the reduced costs.

Each market in the region has allowed or is planning to allow some form of private capital participation in cellular operators. From the perspective of governments, private participation in cellular service provision offers a number of benefits including access to capital, operating experience, and technical expertise. There are several telecommunications companies that are active throughout Latin America. These companies may be categorized as follows:

- Large North American telecommunications companies including U.S. regional Bell operating companies (BellSouth, SBC, Bell Atlantic), GTE, AT&T, Bell Canada International, and Motorola.
- Large European public telecommunications operators (PTOs) including Telefónica de España, France Telecom, and STET International/Telecom Italia.
- Medium sized international telecommunications companies including Millicom (Luxembourgian telecommunications company), Comvik (Swedish cellular operator), Telia (Swedish PTT), and Cable & Wireless (British telecommunications company).

1.4 Calling Party Pays (CPP)

In recent years, there have been a number of developments that have influenced pricing in Latin American markets. Competition has been driving decreasing prices, but calling party pays (CPP) has also significantly affected the market.

Calling party pays (CPP) is widely used for wireless services in Europe and Asia, but has only recently been introduced in the Americas. At the close of first quarter 1999, twelve markets had implemented calling party pays: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Mexico, Paraguay, Peru, Uruguay, and Venezuela.

Under CPP, the calling party must pay for airtime when a call is carried over a wireless network. The typical case is when a person calls from a landline phone to a cellular/PCS phone; in this case the landline caller must pay the airtime. A less frequent case is when a wireless subscriber calls another wireless subscriber; in this case the originating caller must pay both his/her own airtime charges plus the airtime charges of the other party that is being called.

In order to implement CPP, there must be an agreement between the wireline and wireless operators since the wireline operator must bill the subscriber for the airtime charges. Typically, a wireless operator will pay the wireline operator for its billing services by giving the wireline operator a percentage of the airtime revenue. For example, in Ecuador, a wireline customer pays US\$0.31 per minute for calls that terminate on the wireless network. Of that amount, the wireline operator keeps six percent and passes the remaining 94 percent to the wireless network operator.

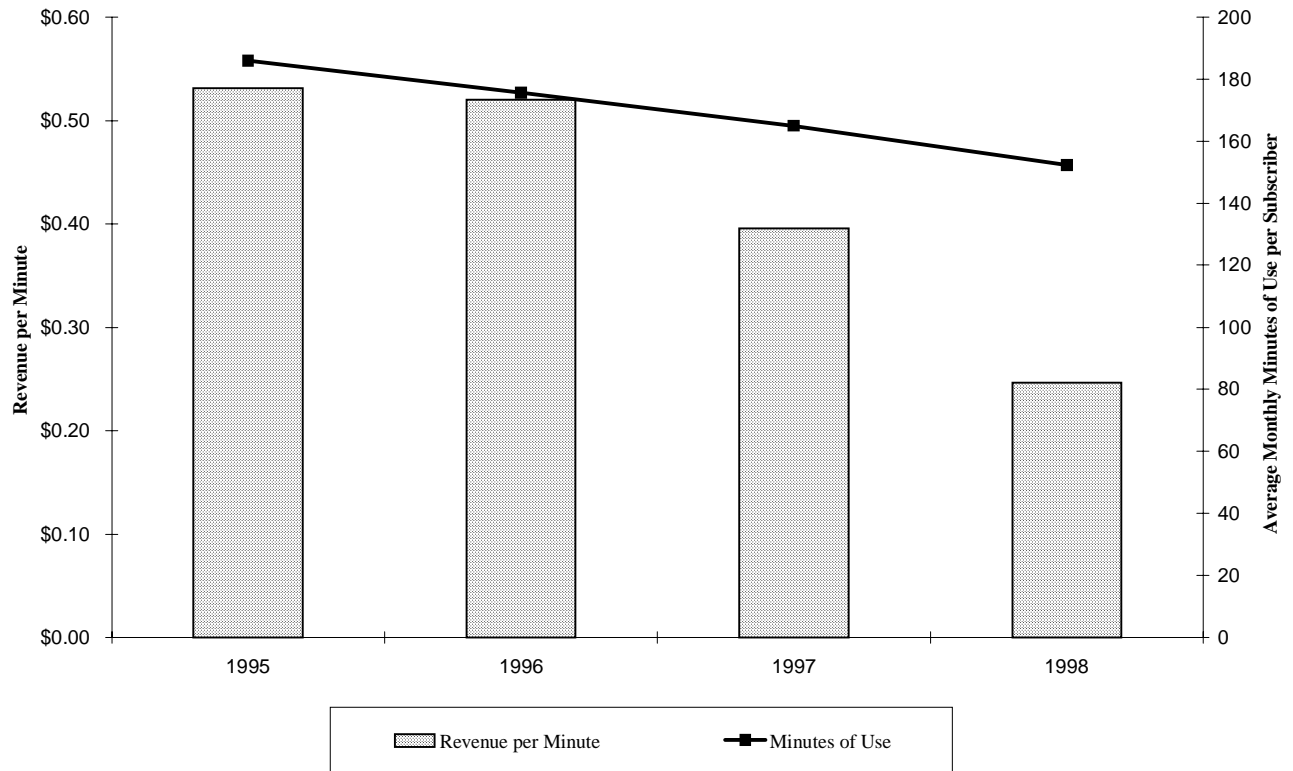
Where CPP has been introduced, operators have experienced increased network traffic in terms of incoming calls, total calls placed, and minutes of use. The main reason for this is that as cellular subscribers shift from always paying airtime to having the calling party pay airtime, their effective monthly bill is lowered. The CPP subscriber has a tendency to use the phone more, since they can consume more minutes for the same monthly bill. Additionally, a subscriber is likely to distribute their cellular number more widely and to keep their phone turned on, since they are no longer responsible for the costs of incoming calls.

1.5 Pre-Paid Cellular

Initially, cellular/PCS service was only available through a contract between the user and the cellular service operator. The contract required the end user to be approved through a credit check, to pay an activation fee for service, to purchase a cellular handset and to be financially liable for recurring usage charges for a fixed length of time (usually at least a year). Recurring charges consist of a fixed monthly fee for service, as well as airtime charges generally billed in per minute increments. The continual payment of a monthly fee and relatively high prices for airtime limited cellular service to high income, high spending segments of the population.

In recent years, increasing competition in cellular/PCS markets across Latin America along with significant handset price reductions, have driven down service prices and initial costs. Per minute charges are falling and operators now offer free minutes with most contract plans. As service prices decline, cellular/PCS is penetrating progressively lower income segments of the population. Lower average minutes of use per subscriber provides an indication of increasing penetration of lower income segments. With less disposable income to spend on cellular service, new subscribers exhibit lower usage patterns than earlier adopters, bringing down overall average minutes of use per subscriber.

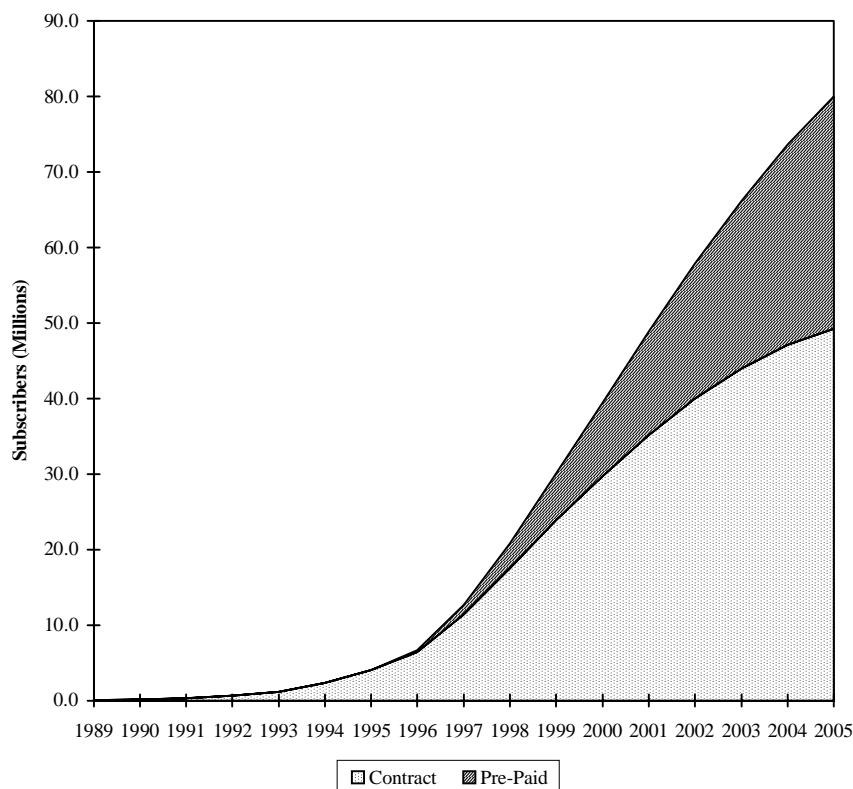
**Exhibit 2 Cellular/PCS Service Revenue per Minute and Average Minutes of Use:
CTC (Chile), 1995-1998**



Source: The Strategis Group

Since its introduction in Latin America in February 1996, pre-paid cellular has grown quickly, accounting for approximately 16% of the installed subscriber base at the end of 1998. By 2005, pre-paid cellular is expected to represent 36% of total Latin American subscribers.

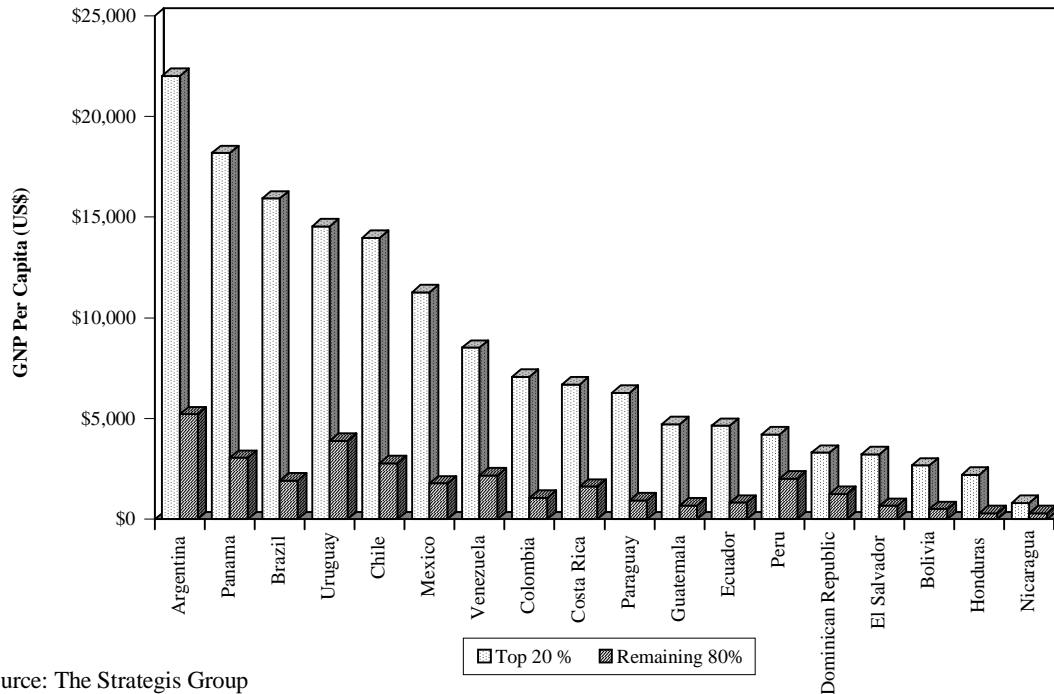
Exhibit 3 Aggregate Cellular/PCS Subscribers: Latin America, 1989-2005



Two main factors favor pre-paid in Latin America: the need to penetrate lower income segments and the existence of a large number of deactivated phones in certain markets. As cellular operators saturate high income segments, there is a need to implement products that appeal to lower income segments.

High income segments, the primary market for contract services, are limited in Latin America due to large inequalities in income distribution. On average throughout Latin America, the top 20% of the population has an income per capita 4 times higher than the bottom 80%. For example, in Argentina, the top 20% of the population has a GNP per capita 3 times higher than that of the bottom 80%. In Brazil, the top 20% of the population has a GNP per capita 7 times greater than that of the remainder of the population.

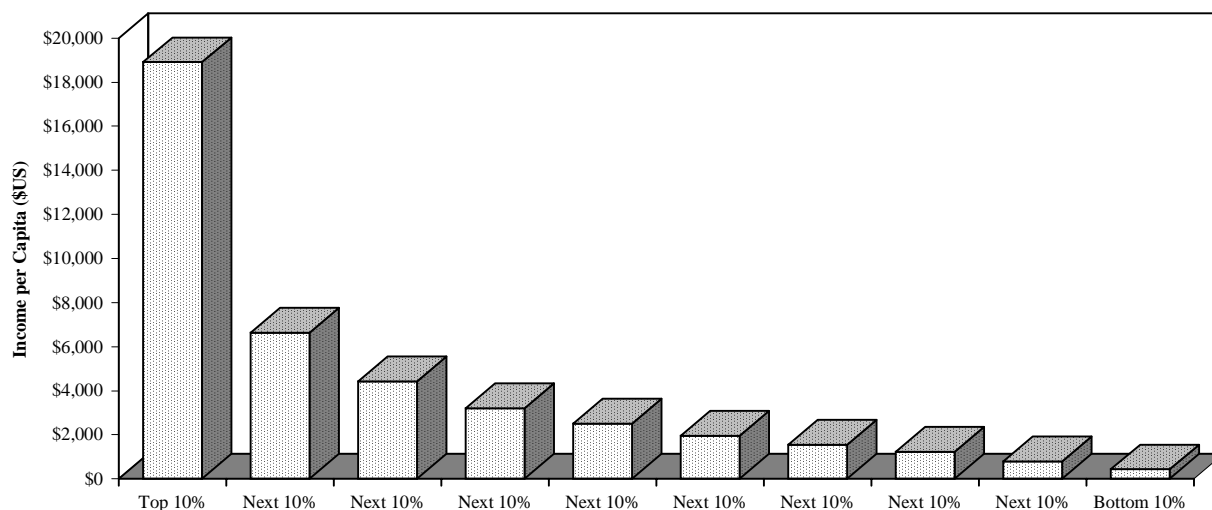
Exhibit 4 Income Distribution in Latin America: GNP per Capita, Top 20% vs. Bottom 80% of the Population, Selected Countries



Source: The Strategis Group

In addition, income is spread out more evenly across the bottom 80-90% of the population, resulting in a very small middle class in Latin America. For the sample of countries in the previous figure, the top 10% of the population earns almost US\$20,000 per capita while income per capita for the next 10% falls dramatically to \$7,000 (see figure). Consequently, contract cellular/PCS service prices must drop dramatically for service to be accessible to the majority of the population. Cellular is clearly a luxury good available to only elite portions of the market.

Exhibit 5 Per Capita Income by Population Decile (Sample Weighted Averages), Selected Latin America Countries*



*Sample includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Uruguay, Venezuela

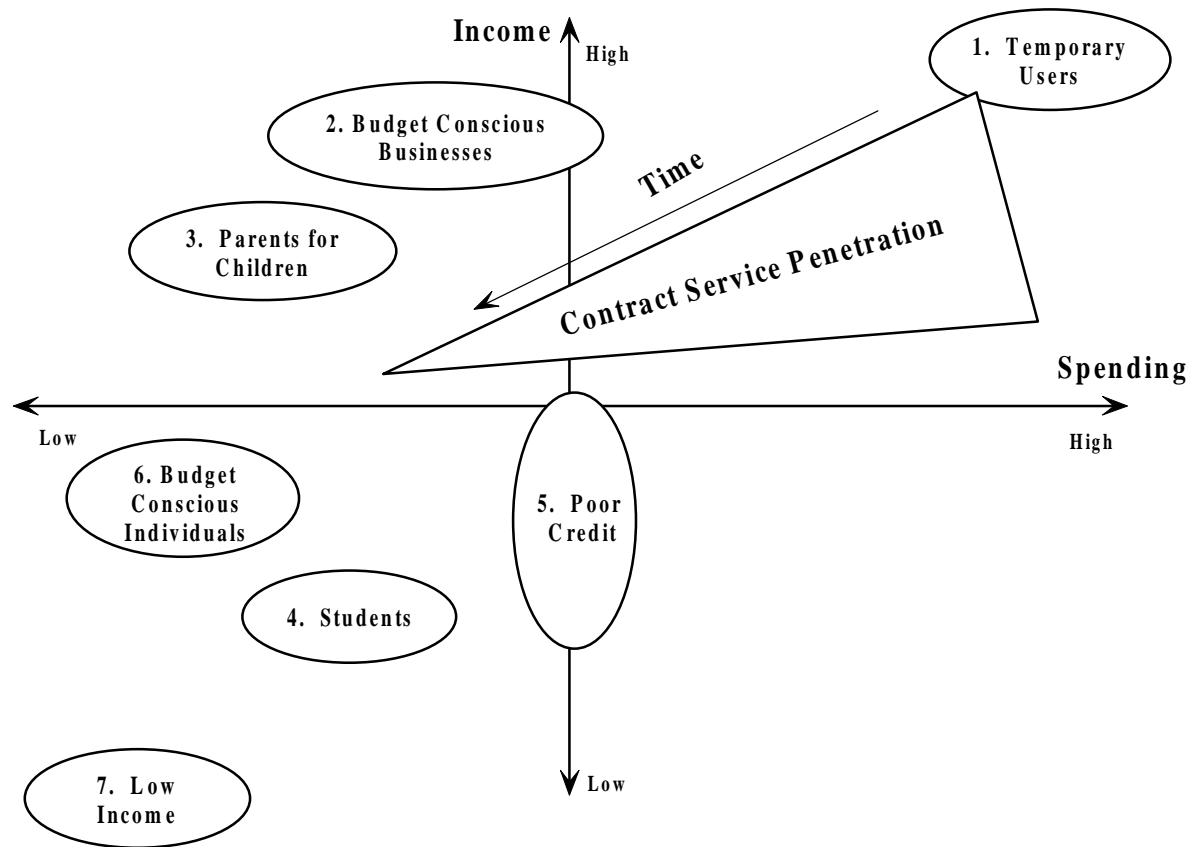
Source: The Strategis Group

Pre-paid reduces the effective cost of cellular by eliminating the monthly fee and allowing for flexible spending, lowering the barrier to entry, and expanding the addressable market to include lower income segments.

The Strategis Group has identified eight market segments that lie outside the potential market for contract service but are likely adopters of pre-paid service.

1. Temporary Users
2. Budget Conscious Businesses
3. Parents
4. Students
5. People with credit issues
6. Budget Conscious Individuals
7. Low income
8. Anonymity

Exhibit 6 Pre-Paid Cellular Market Segments



1.6 Lessons Learned from the Case Studies

The Strategis Group chose three case studies for detailed analysis of pre-paid cellular service in Latin America: Telcel (Mexico), Telcel (Venezuela), and Comcel (Colombia). By using these case studies, The Strategis Group provides an issue by issue analysis of pre-paid service.

In the analysis, it was found that the demand for pre-paid versus contract service is largely a function of service pricing and usage levels. Rational consumers were found to select the pricing plan that provides them with the lowest total cost at their usage levels, regardless of income.

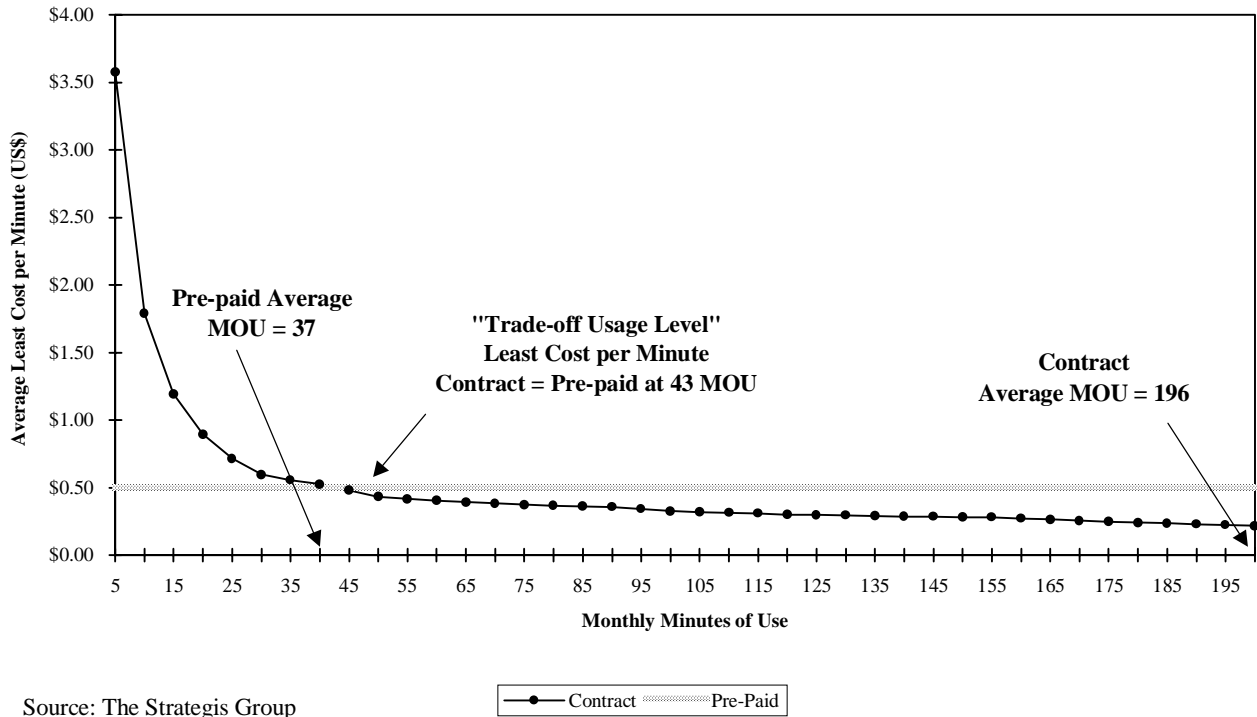
There is a threshold, the “**trade off usage level**,” that determines whether contract or pre-paid provides the best value given the usage pattern of the individual. The trade off usage level is the monthly usage level along the least cost per minute curve where the least cost minute for contract service equals the prepaid per minute price. For contract services, least cost per minute includes the distribution of fixed monthly fees across the minutes used. Operators establish contract and pre-paid service prices that determine the trade off usage level.

The trade off usage level indicates the range of average monthly usage where prepaid is more economically efficient for a subscriber than contract service (or vice versa). By setting the trade of usage level, operators can encourage a desired mix of pre-paid and contract subscribers. Relatively higher trade off usage levels make prepaid service more economically efficient for a wider range of average monthly usage levels, whereas lower trade off usage levels make prepaid economically advantageous only for low use subscribers.

In general, operators try to set the trade off usage level to encourage subscriber growth without cannibalizing current or future contract subscribers. Higher income, higher spending individuals provide a constant revenue stream for the operator through a contract subscription. Operators that follow a revenue maximizing strategy prefer to penetrate higher and middle income segments with contract service, while targeting lower income segments with pre-paid service.

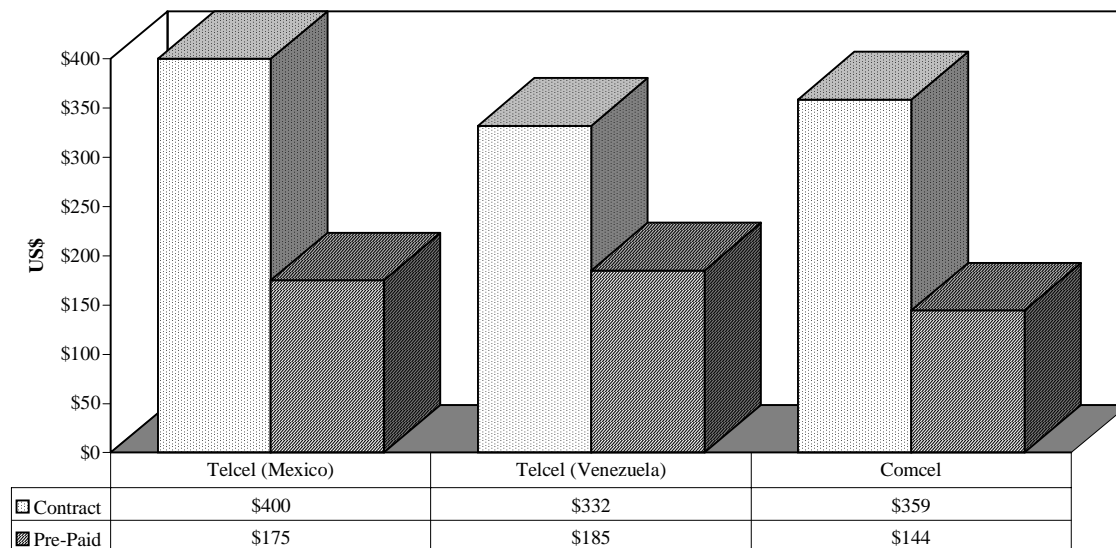
The trade-off usage level can be illustrated using the example of Telcel's (Mexico) pricing for contract and pre-paid service. Examining the pricing plans, the trade-off usage level for Telecel (in these regions) is 43 minutes of use per month. Above this rate, contract services are more cost effective, while below pre-paid service are more cost effective to the user. Pre-paid subscribers use service an average of 37 minutes a month, while contract subscribers use 196 minutes a month. On average, Telcel's cellular subscribers have chosen the plan that is most economically efficient.

Exhibit 7 Average Least Cost per Minute, Contract vs. Pre-Paid: Telcel Regions 5,6,7,9



The demand for pre-paid use is also a result of the effective cost of service, the price a potential user must pay for the first year of cellular service. It consists of the cost of activation, the least expensive handset, and twenty minutes of use a month. As seen in the following figure, pre-paid's effective cost is significantly less than contract service. This is due to the low price of pre-paid kits and the removal of fixed monthly payments.

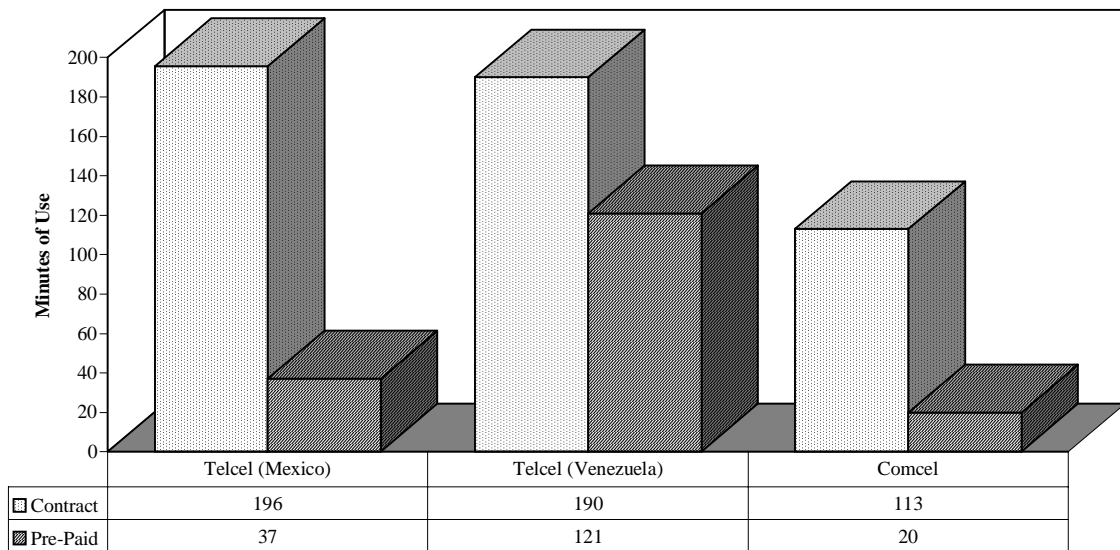
Exhibit 8 Effective First Year Cost Differential: Selected Operators, Contract vs. Pre-Paid



Source: The Strategis Group

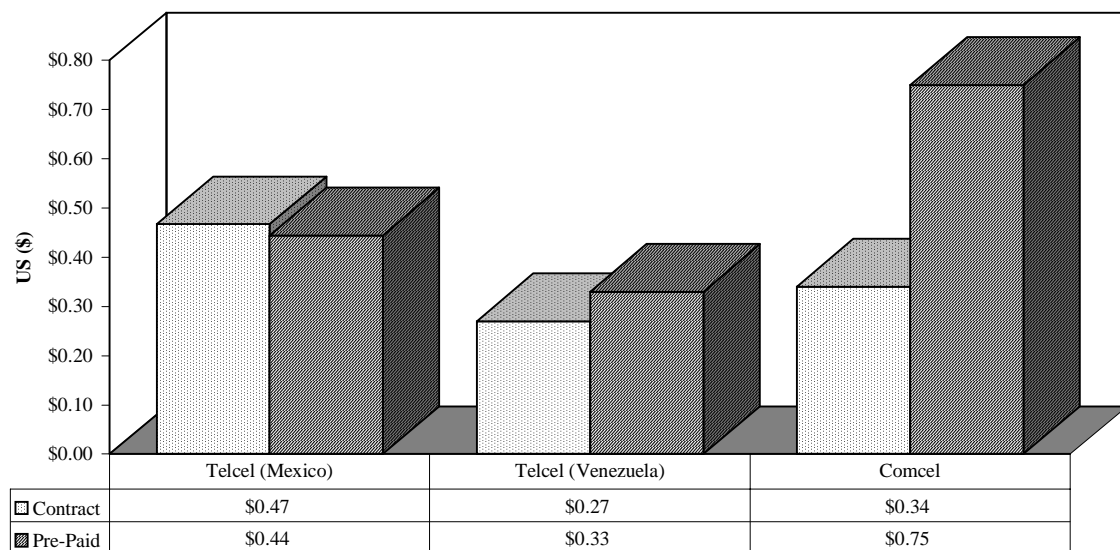
In general, pre-paid users record lower minutes of use per month than contract subscribers do. This is the result of higher per minute rates and of the market segments that pre-paid targets. Telcel (Mexico) and Comcel contract subscribers use an average of more than five times as many minutes per month than the operator's pre-paid subscribers. In contrast, Telcel (Venezuela) contract subscribers, facing a much lower differential between contract and pre-paid per minute rates, only use 1.6 times as many minutes per month as Telcel's pre-paid subscribers.

Exhibit 9 Average Minutes of Use; Selected Latin American Operators



Source: The Strategis Group

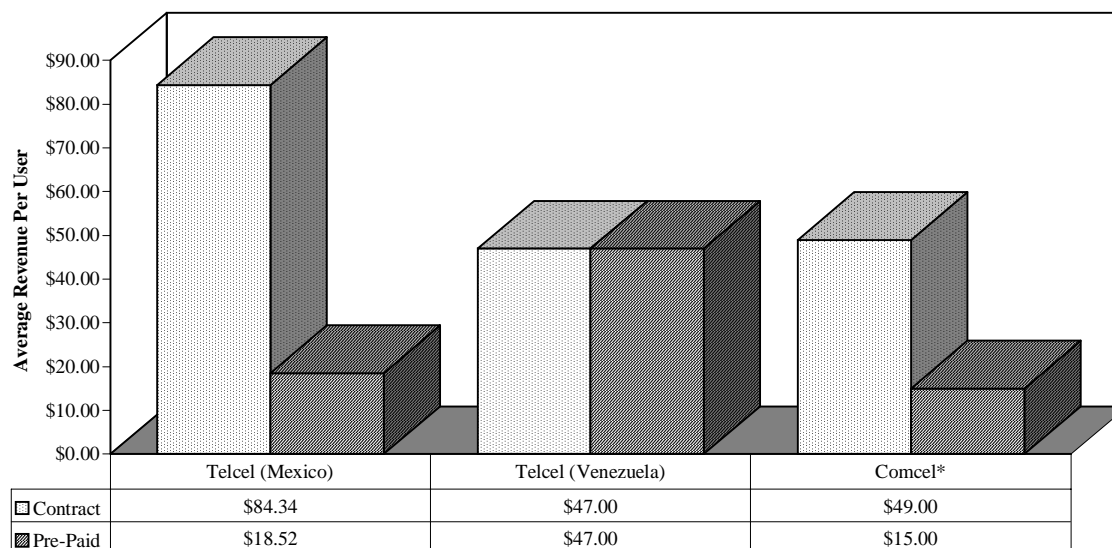
Exhibit 10 Revenue per Minute, Selected Latin American Operators



Source: The Strategis Group

Minutes of use directly relate to an operator's average revenue per user (ARPU). ARPU for pre-paid subscribers is usually significantly less than contract ARPU. Pre-paid users exhibit lower usage and, although billed at a higher rate, generate less average revenue than contract users. This is true for both Telcel (Mexico) and Comcel (see figure).

Exhibit 11 Average Revenue per User (Contract versus Pre-Paid); Selected Latin American Operators



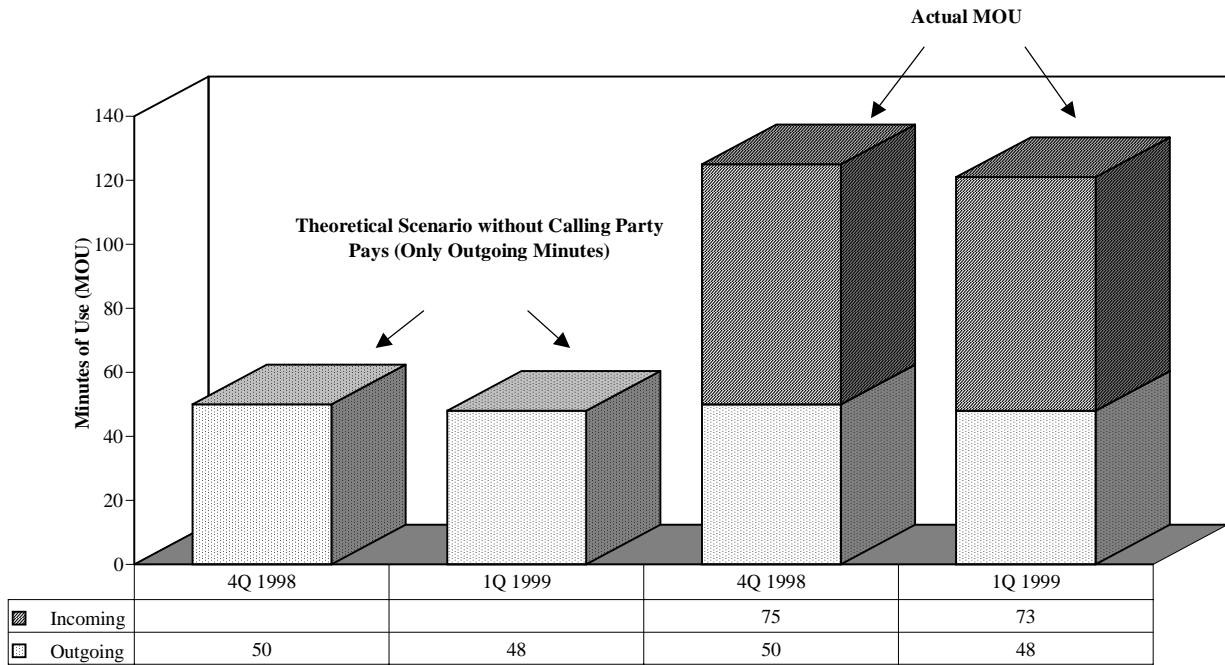
*Note: Comcel's Pre-Paid ARPU estimated

Source: The Strategis Group

For Telcel (Venezuela), first quarter 1999 contract and pre-paid ARPU were equal at US\$47 a month. This is a unique situation that can be attributed to a declining contract ARPU and a relatively high pre-paid ARPU. Due to competition, contract subscribers are receiving more minutes per month and lower monthly fees, bringing down contract ARPU. Pre-paid ARPU is relatively high as a result of the additional revenue due to calling party pays (see below).

In a mobile party pays environment, a pre-paid subscriber must pay for all usage (outgoing and incoming). In a calling party pays system, a pre-paid subscriber only pays for outgoing usage while incoming calls are billed to the calling party. Consequently, pre-paid subscribers tend to use cellular more in a calling party pays market since part of their usage is paid for by third parties. Even though incoming usage is generally billed at a lower rate than the pre-paid price per minute, higher usage relative to a pre-paid subscriber in a mobile party pays market leads to a higher ARPU generated by a pre-paid subscriber in a calling party pays market, all other things being equal. As a general rule, operators with pre-paid in calling party pays markets earn substantially higher average revenues per pre-paid subscriber than operators in mobile party pays markets.

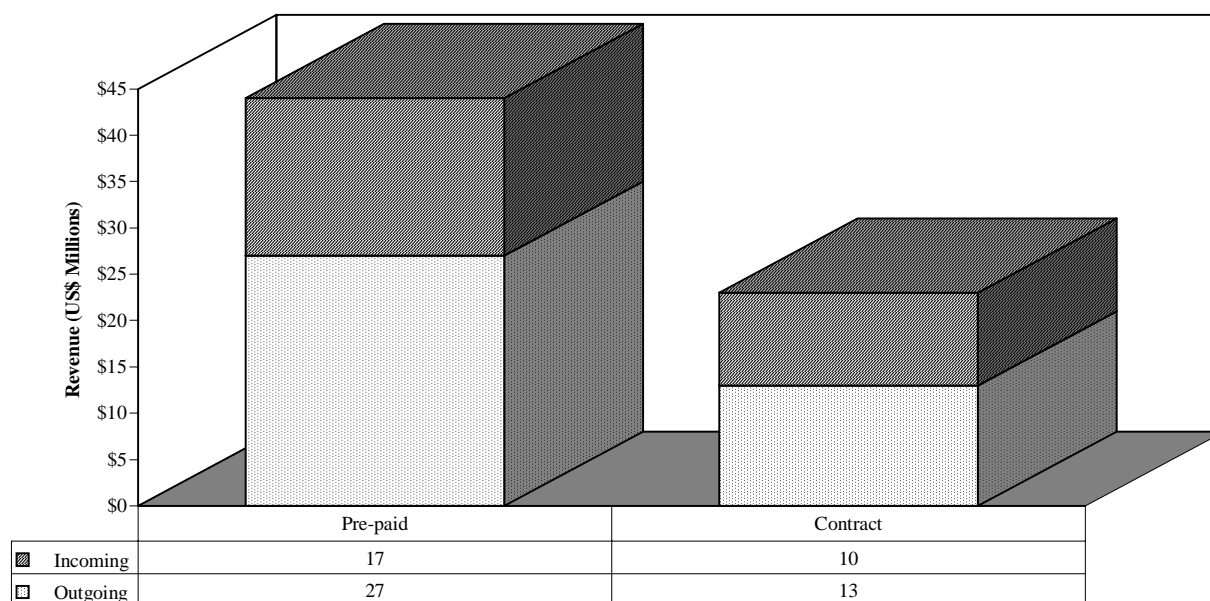
Exhibit 12 Pre-Paid Scenario with & Without CPP: Telcel (Venezuela)



Source: The Strategis Group

Incoming and outgoing total service revenue is not proportional to minutes of use. For Telcel (Venezuela), incoming minutes account for 60% and 47% of total minutes for pre-paid and contract service, respectively. However, incoming revenue accounts for 39% of pre-paid revenue and 43% of contract revenue. This discrepancy is due to the revenue that the fixed line operator (CANTV) receives for incoming minutes. Nevertheless, calling party pays results in a significant increase in revenues for Telcel (Venezuela), even if not proportional to minutes logged.

Exhibit 13 Service Revenue for Incoming and Outgoing Usage: Telcel (Venezuela) (US\$ Millions)



Source: The Strategis Group, based on information from Telcel, 1Q 1999

A benefit of pre-paid cellular/PCS service is the lower acquisition costs for pre-paid customers due to the characteristics of pre-paid versus contract service. In general, acquisition effort (and cost) is positively correlated with price and complexity and negatively correlated with commoditization. Pre-paid cellular service is relatively low priced compared to contract service. Low prices and the "out-of-the box" nature of pre-paid kits are rapidly turning cellular service into a commodity. Contract service, on the other hand, has a higher price, longer commitment, and greater complexity. Consequently, pre-paid requires substantially less acquisition effort (and cost) than contract service.

Churn is the percentage of a carrier's customer base that discontinues service within a particular time, usually expressed as a monthly or annual percentage. Churn is an important component of operations as it impacts both operating expenses and revenue. Lost customers entail lost revenue and increased expenses for the carrier. The higher the churn rate, the more a carrier must spend on marketing to maintain and grow its subscriber base.

Churn rates are usually higher for pre-paid service relative to contract. Higher pre-paid churn rates are partly due to differences in accounting for churn between contract and pre-paid. For instance, Telcel (Venezuela) pre-paid subscribers who are inactive for 4 or more months are automatically disconnected from the network. For Telcel (Mexico), this time period is 10 months, while Comcel disconnects a pre-paid subscriber after a total of 4 months for its lower priced card and 5 months for its higher priced card. As a result, Telcel (Venezuela) has a pre-paid churn rate of 8%,

while Telcel (Mexico) averages 4% monthly pre-paid churn. Many of these subscribers reactivate by paying an activation fee and are then counted as new subscribers. In this case, the subscriber never willingly left the network or switched operators, but was counted as a churned subscriber.

In certain cases, a higher churn rate can be due to the technology employed in the market. For example, Telcel Venezuela's higher churn for both pre-paid and contract may be partly due to the fact that Telcel's competitor Movilnet uses the same technology (CDMA) as Telcel. In most markets, the option of going to another operator's system is not always applicable due to differences in technology. If a user owns a TDMA phone using Telcel Mexico's pre-paid system, it is not logical to go to Iusacell, because they utilize CDMA technology. This would require purchasing a new handset and pre-paid subscribers tend to be price sensitive and unwilling to do this. For markets such as Venezuela, where operators utilize the same type of technology, churn via 'stealing' may be a serious issue, especially with the flexibility of using any handset that pre-paid offers. This is also the case for Comcel and its competitor Columovil, both using AMPS/TDMA technologies.

In any case, pre-paid subscribers are more likely and able to discontinue service than are contract subscribers. Contract subscriptions usually require an obligation of at least one year whereas pre-paid has no obligation. In addition, contract subscribers generally exhibit higher and more stable usage patterns, diminishing the likelihood of discontinuing service. Operators tend to devote more resources to retaining contract subscribers due to the higher and more constant revenue stream they provide relative to pre-paid. Retention programs for pre-paid subscribers are difficult to implement due to the lack of information about pre-paid customers. Unlike contract subscribers, pre-paid users are not required to provide operators with contact information.

1.7 Conclusions

In the analysis of the pre-paid situation in Latin America, The Strategis Group has determined the following conclusions:

1. **Pre-paid broadens the addressable market by 200-300%.** Due to the lower effective cost of pre-paid service and the flexibility in usage it offers, pre-paid expands the addressable market. In Latin America, contract cellular/PCS service has penetrated most of the upper income segments of the population. However, gradual contract price declines have not been successful at penetrating the broader, lower income segments primarily due to the small middle class in most of these nations. Given the income distribution, cellular service prices must drop significantly to become accessible to this broader market base. Pre-paid, however, with lower effective entrance costs, and flexible spending, takes the market "from the bottom up," and has the potential to capture significantly larger amounts of the population in Latin American markets.
2. **Pre-paid segments the market to match lower revenue subscribers to lower cost services.** With careful pricing, pre-paid captures the low usage subscribers who would benefit from mobile services, but cannot afford current contract prices. Despite higher per minute rates, these users will generally earn less revenue than contract subscribers. However, operating costs for pre-paid subscribers are also significantly less than for contract subscribers. Mass market distribution lowers the acquisition cost, selling the service in a box limits the customer

service contact, and the pre-paid nature eliminates the need for billing and collections. By matching lower revenue subscribers to lower cost services, cellular operators can maintain or extend the margin earned per user.

3. **Pre-paid transforms cellular/PCS service into a “product,” enabling the use of distribution channels better suited to mass market adoption.** Lower effective prices and the "out-of-the box" nature of pre-paid kits are rapidly turning cellular service into a product. Pre-paid kits can be distributed in almost any type of store, opening up huge possibilities for targeting a wide range of consumers. In addition, this type of distribution lowers the barriers to the purchase of cellular service, enables gift and impulse buying, and .
4. **Trade off price level determines the mix of contract to pre-paid adoption.** The pricing of cellular pre-paid plans will determine the number of subscribers that are attracted to the service. Careful pricing will limit cannibalization of an operator’s contract subscriber base, yet increase pre-paid subscriber rolls from previously unserved segments of the population. An operator must manage a delicate balance on the trade-off price level to maximize total revenues across the two types of service.

1.8 Future Implications

There are a number of implications that could evolve from the wide use and acceptance of pre-paid service.

1.8.1 Pre-paid segments the market by usage

Cellular operators may continue to pursue the strategy which is most commonly found in the marketplace today, using pre-paid to address lower usage or temporary usage segments. Contract users are primarily higher end consumer and business users. In this case, the trade-off usage level will largely dictate the mix of pre-paid to contract subscribers within the market. As pre-paid rates decline (in response to increasing competition and supply of capacity from digital), the service will appeal to an even broader share of the market.

This has occurred in Europe, where mid level users, such as college students and professional choose pre-paid plans over available contract plans. As a result, Europe has experienced large pre-paid growth and a polar dynamic in type of user for pre-paid and contract. Contract users are high end business and wealthy users who have a very high average minutes of use. Pre-paid is used by low to mid level users. Operators have segmented the market into two and can market the services differently according to the different demographic characteristics of these groups.

1.8.2 Pre-paid is a platform for developing new contract subscribers

One other recurring theme among pre-paid operators is the desire to gradually migrate these customers to contract services. While it remains to be seen whether this is the long-term goal, pre-paid may prove to be an effective tool for market development. By cultivating wireless usage in a broader share of the total market, pre-paid is creating a culture in which mobile services are a common necessity rather than a luxury. As prices continue to fall and as incomes rise (with economic

development), wireless is positioning itself to have a ready future audience of users who demand service. Migration will remain largely a function of price, however, necessitating continue declines in service pricing to make contract services accessible to many pre-paid users.

1.8.3 Pre-paid becomes the pricing plan of choice for the operator

Pre-paid cellular/PCS becomes the plan of choice of operators and they migrate all subscribers to pre-paid plans. The operator develops multiple pre-paid pricing levels to appeal to all segments of the market, including high-end users. In this manner, the operator limits operating costs by lowering acquisition costs, eliminating billing, and lowering the necessary contact for customer maintenance. These factors already contribute to rising pre-paid profit margins and through careful marketing, operators can alter the image that pre-paid has a lower status than contract service. To implement this strategy to high end users the operator might implement an automated account type system that automatically debits a checking account or credit card when the value of the account runs low.

1.8.4 The network operator sells capacity rather than service

Pre-paid is raising the question of what role cellular operators should take within the market. To date, most operators have been service providers as well as network operators, establishing relationships with the end-user to sell their services. However, pre-paid service can be considered a type of wholesale approach to cellular/PCS as operators forgo the close relationship with subscribers typical to contract service. Operators then become concerned with network utilization and minutes of use, instead of average revenue per subscriber. The revenue per minute that an operator can collect either by the reseller or the pre-paid subscriber, becomes a more important measure of an operator's profitability.

Some cellular operators have done this, have also kept their contract base. For example, US wireless operators sell capacity on their 800 MHz AMPS networks to MCI and others who in turn handle all the marketing for the usage of these minutes. The calls are carried on the local wireless network and the operator receives its revenue upfront when it sells the minutes to the reseller. This is what occurred over time in long distance service in the United States and operators now resell airtime to a large number of resellers. Whether cellular operators will abandon the contract subscribers and use a wholesaler approach remains to be seen.

1.8.5 Pre-paid changes the value proposition

Currently, the measure of success in the cellular industry is ARPU and subscriber growth. Increasing subscriber rolls leading to higher total revenues for the operator generally offsets lower ARPU. However, there will come a point in time when growth slows, causing total revenues to decline with falling ARPU. When this occurs, The Strategis Group believes that companies will begin to be evaluated on an average revenue per minute basis rather than the per subscriber premise that is used today. Operators with the highest revenue per minute will be in a better position to deal with future changes that might occur in the cellular industry. As a result, the higher revenue per minute that pre-paid subscribers generate could significantly benefit operators as the industry metric shifts.

**Cellular/PCS Subscribers by Type (Contract and Pre-Paid);
Latin American Countries: 1999-2005**

	1999	2000	2001	2002	2003	2004	2005
<u>Argentina</u>							
Contract	3,881,533	4,681,606	5,363,519	5,927,272	6,372,864	6,700,295	6,909,565
Prepaid	214,264	633,766	1,152,320	1,705,582	2,229,209	2,830,492	3,356,455
Total	4,095,797	5,315,372	6,515,839	7,632,854	8,602,073	9,530,787	10,266,020
<u>Belize</u>							
Contract	4,164	5,598	7,129	8,653	10,067	11,267	12,150
Prepaid	-	-	-	-	-	-	-
Total	4,164	5,598	7,129	8,653	10,067	11,267	12,150
<u>Bolivia</u>							
Contract	427,050	560,715	667,940	762,730	853,470	916,300	923,790
Prepaid	10,950	29,511	66,060	94,270	127,530	161,700	189,210
Total	438,000	590,226	734,000	857,000	981,000	1,078,000	1,113,000
<u>Brazil</u>							
Contract	10,420,308	12,680,104	14,490,546	16,343,435	17,805,368	18,715,970	19,264,701
Prepaid	829,687	1,730,129	2,843,874	4,236,514	5,795,518	7,397,590	9,029,173
Total	11,249,995	14,410,232	17,334,420	20,579,949	23,600,886	26,113,560	28,293,874
<u>Chile</u>							
Contract	853,635	1,030,063	1,203,272	1,366,883	1,509,436	1,615,635	1,666,780
Prepaid	571,361	769,123	932,294	1,080,253	1,226,461	1,381,214	1,552,210
Total	1,424,996	1,799,186	2,135,566	2,447,136	2,735,897	2,996,848	3,218,990
<u>Colombia</u>							
Contract	2,543,002	3,330,216	4,089,364	4,837,179	5,506,410	6,000,660	6,342,480
Prepaid	51,898	138,759	215,230	254,588	289,811	383,021	477,391
Total	2,594,900	3,468,975	4,304,594	5,091,767	5,796,221	6,383,681	6,819,871
<u>Costa Rica</u>							
Contract	131,319	168,384	206,469	248,877	286,918	331,810	377,726
Prepaid	-	3,436	10,867	18,733	35,462	49,581	66,657
Total	131,319	171,820	217,336	267,609	322,380	381,391	444,383
<u>Dominican Republic</u>							
Contract	281,438	353,258	439,570	544,725	663,540	799,527	909,963
Prepaid	49,666	72,354	103,109	144,800	198,200	266,509	389,984
Total	331,104	425,613	542,679	689,526	861,741	1,066,036	1,299,947
<u>Ecuador</u>							
Contract	82,218	105,850	131,208	157,844	185,316	213,184	241,011
Prepaid	1,678	6,161	12,977	22,549	35,298	51,641	71,990
Total	420,702	566,150	711,946	850,119	972,697	1,071,708	1,139,180
<u>El Salvador</u>							
Contract	395,459	509,535	612,274	697,098	758,703	793,064	797,426
Prepaid	25,242	56,615	99,672	153,021	213,993	278,644	341,754
Total	83,896	112,011	144,184	180,393	220,614	264,825	313,001

**Cellular/PCS Subscribers by Type (Contract and Pre-Paid);
Latin American Countries: 1999-2005 (continued)**

	1999	2000	2001	2002	2003	2004	2005
Guatemala							
Contract	146,006	202,330	272,875	349,565	433,218	515,900	599,802
Prepaid	7,685	20,011	33,726	56,906	88,731	137,138	199,934
Total	153,691	222,341	306,601	406,471	521,950	653,038	799,736
Honduras							
Contract	36,000	49,686	62,792	76,309	92,114	108,387	124,800
Prepaid	-	1,014	4,008	8,479	14,995	23,792	35,200
Total	36,000	50,700	66,800	84,788	107,109	132,180	160,000
Mexico							
Contract	1,998,181	2,700,968	3,392,956	4,030,900	4,574,812	4,987,957	5,236,854
Prepaid	2,845,894	3,968,089	5,142,782	6,304,741	7,385,481	8,313,261	9,013,089
Total	4,844,075	6,669,057	8,535,737	10,335,641	11,960,293	13,301,218	14,249,943
Nicaragua							
Contract	31,679	50,015	70,192	92,370	115,916	140,200	164,591
Prepaid	-	1,021	4,880	11,416	21,263	35,050	53,410
Total	31,679	51,036	75,072	103,786	137,179	175,251	218,001
Panama							
Contract	106,124	166,477	237,278	316,679	402,832	493,891	588,009
Prepaid	6,177	16,465	33,897	60,320	97,580	147,526	212,003
Total	112,300	182,942	271,175	376,999	500,413	641,418	800,013
Paraguay							
Contract	75,594	103,285	131,209	156,702	177,102	189,745	191,970
Prepaid	170,406	208,819	237,809	258,723	273,753	285,091	294,931
Total	246,000	312,104	369,018	415,425	450,854	474,837	486,901
Peru							
Contract	1,079,195	1,359,150	1,633,600	1,941,420	2,192,600	2,379,100	2,494,800
Prepaid	93,843	239,850	408,400	547,580	692,400	835,900	970,200
Total	1,173,038	1,599,000	2,042,000	2,489,000	2,885,000	3,215,000	3,465,000
Puerto Rico							
Contract	709,894	843,854	949,157	1,038,914	1,103,136	1,153,648	1,174,745
Prepaid	61,730	115,071	167,498	212,790	258,760	288,412	312,274
Total	771,624	958,925	1,116,655	1,251,703	1,361,896	1,442,060	1,487,019
The Caribbean							
Contract	226,597	257,786	293,482	331,316	371,186	408,595	446,801
Prepaid	-	5,261	9,077	13,805	19,536	30,754	44,189
Total	226,597	263,047	302,559	345,121	390,722	439,349	490,990
Uruguay							
Contract	142,134	156,374	167,896	177,119	184,438	190,218	194,802
Prepaid	5,922	9,981	14,600	19,680	25,151	30,966	37,105
Total	148,057	166,355	182,495	196,799	209,588	221,184	231,907
Venezuela							
Contract	1,072,754	1,103,620	1,181,849	1,237,822	1,284,147	1,307,403	1,307,570
Prepaid	1,557,246	2,056,380	2,358,151	2,614,178	2,836,853	3,053,597	3,272,430
Total	2,630,000	3,160,000	3,540,000	3,852,000	4,121,000	4,361,000	4,580,000

November 3, 1999

Latin America Wireless

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Profitability First!

Prices as of October 29.

Wireless subscriber growth in Latin America has been remarkable over the past few years. The number of wireless users in the region has soared from 12.9 million in 1997 to an expected 36.7 million in 1999 and 50.2 million in 2000 — some 285% and 390%, respectively. The challenge now is to transform this impressive subscriber growth into shareholder value.

Strategies Vary

Latin operators are taking different approaches to expanding their businesses and becoming competitive. Some companies are cream-skimming the market, trying to grow *and* maintain profitability. At the other end of the spectrum are the firms that focus primarily on subscriber growth and market share gains, with little regard for profitability.

At this point, we favor the companies that stress profitability. The region's average revenue per user (ARPU) is falling rapidly as penetration rises. It's gone to \$46 from \$82 in the past two years, while penetration has increased to 7.8% from 3.3% at the end of 1997.

Focusing solely on market share is too risky in Latin America, we believe. Given the region's poor income distribution and low GDP, we're concerned that the sustainable ARPU at penetration levels over 15% is too low. Today, most new users in the region generate monthly ARPU in the range of only \$9–20. By our estimates, the operators will realize profits by adding users at these ARPU levels only if the total subscriber acquisition cost does not exceed \$70–80 per gross addition. We believe it will be difficult for Latin operators to raise penetration significantly at low acquisition costs.

Subsidies Create Difficulties

Many operators are subsidizing handsets, though some expect to begin reducing these subsidies, which will increase the entry price for consumers. These operators plan to offer free minutes to users instead of lower handset prices. We see this strategy as favorable, since it increases customer loyalty and tends to promote usage.

We believe the biggest threat for incumbents is not the loss of market share to new entrants, but the loss of heavy users in the network, as these are a wireless operator's most profitable customers.

In Latin America, some companies are reacting well to the more intense competitive environment. Flat-rate plans are being introduced for heavy users. And the deployment of the digital network is fairly advanced in the region, as most firms have already migrated many of their heavy users to digital phones. New entrants must face incumbents that have digital networks, wide coverage, and better financials.

Favorite Stocks

Among the wireless names in the region, our top pick is Iusacell. The company has strong operating momentum and favorable long-term growth prospects. Contrary

to the Brazilian cellular operators, Iusacell has achieved relatively stable ARPU and margins. We reiterate our Outperform rating and our price target of \$16.50.

We also consider Tele Celular Sul and Tele Nordeste Celular, Telecom Italia Mobile's subsidiaries in Brazil, compelling investments. In our view, both are well managed by European operator TIM and have clear growth strategies. What's more, we find valuation appealing. Our new 12-month target of \$23 for Tele Celular Sul assumes that the shares will trade at 5.8 times next year's EBITDA. For Tele Nordeste Celular, our \$30 target assumes that the stock will sell at a 4.3 multiple.

Investment Positives

- **Strong Subscriber Growth** Subscriber growth in the region has been surprising even the most optimistic analysts. Today, there are 28.5 million wireless subscribers in Latin America, versus 16.4 million a year ago. We expect some 90 million by the end of 2003, for 29% average annual growth over the next four years.
- **Low Penetration** Wireless penetration in Latin America is only 7.8%, versus 40% in Europe, 26% in the US, and 30% in Asia. We expect it to reach 21.6% by the end of 2003.
- **Incumbents Have an Edge** The incumbent cellular operators enjoy a major advantage over the new entrants, as they have most of the heavy users in their networks, and these are the most profitable subscribers. Furthermore, incumbents benefit from stronger cash flows and better balance sheets.
- **Heavy Users Offer Upside Potential** Some companies in the region are focusing on heavy users by introducing flat-rate plans and migrating these users to digital networks. ARPU for heavy users is rising as new plans are implemented (based on usage patterns) and new services (including data) are introduced.
- **Consolidation Trend Positive for Stocks** The auction of PCS licenses next year and consolidation after 2001 will enable companies to expand their footprints and offer flat-rate plans. In Brazil, none of the companies has a nationwide footprint today.
- **Extraordinary Usage Growth** As in the US and Europe, we believe that new tariff plans will prompt meaningful advances in minutes of use (MOU) in Latin America. Some countries, like Venezuela, Chile, and Mexico have already started offering plans based on a "bucket of minutes" (bundled minutes) concept, eliminating roaming and domestic long-distance charges.
- **Advanced Deployment of Digital Network** Latin companies have advanced nicely in deploying digital networks, which allows them to compete more effectively against new entrants and gives them available capacity to implement more aggressive pricing plans.
- **Fashionable Product** The "cellular-is-cool" effect is alive and well in the region. In some countries, such as Brazil and Venezuela, cellular phones aren't just tools that facilitate personal communication, they're also viewed as status symbols and personal safety devices.
- **Data Business Offers Upside** Latin wireless operators are beginning to offer data services, which can help boost ARPU, especially for contract subscribers. The trends for wireless data are extremely positive.
- **Cost-Cutting Potential** We see considerable upside in terms of efficiency gains for some of the Brazilian cellular companies. Gains should come from consolidation and the elimination of interconnection costs. We'll

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probably witness the onset of consolidation among Brazilian cellulators before year-end.

- **Liquidity Could Improve** We believe that an improvement in the prospects for emerging markets will shift liquidity from TBH to the 12 holding companies,

improving the stocks' trading volumes. The daily trading volume of TBH (basket of 12 telecom stocks, representing the parts that formerly made up Telebras) is roughly \$82 million, while all telecom Brazilian operators together have a daily trading volume of only \$32 million.

Investment Concerns

- **Economic Uncertainty** We consider the uncertainty in the region's economic climate the principal investment concern related to the Latin wireless operators. This is especially true for companies operating in less-developed areas, where potential demand is lower than average. A scenario of inflation and currency devaluation would have a significant negative effect on our outlook for the companies.

- **Poor Income Distribution** The demand for cellular phones is related to the distribution of income, consumption levels, and employment rates. The recent economic crisis in some Latin countries left consumer patterns even further behind those of European countries and the US than before.

- **Difficult Economics of Prepaid Business** Unlike the case in Europe, where prepaid products have high EBITDA margins and high ARPU, for Latin wireless operators, prepaid EBITDA margins are slightly lower than those for contract users.

- **Prepaid Users Generate Low ARPU** Prepaid ARPU in Europe is in the \$17-35 range, versus just \$9-25 in Latin America. Despite low penetration, ARPU is already low in the region.

- **Acquisition Costs Still High** An increase in penetration must be followed by a reduction in the subscriber acquisition cost, mainly for prepaid users, if operators are to maintain reasonable profitability. Marginal subscri-

ers are generating ARPU of \$9-20, and acquisition costs average some \$70 per gross addition.

- **ARPU Off Sharply with Penetration Growth** ARPU in Latin America is only \$46, despite low penetration rates. For similar levels of penetration in the US and Europe, ARPU was \$65 and \$90, respectively.

- **Handset Subsidies for Prepaid Users** Companies that subsidize prepaid phones tend to suffer, due to the low ARPU generated by these users and the potential for high churn.

- **Analog Subscriber Base Still Big** For some countries in the region, like Mexico, Chile, and Peru, the prepaid subscriber base uses mostly analog phones. Network capacity has become a big issue in the wireless sector, as MOU have jumped dramatically with reductions in price. A new entrant with network capacity to spare could represent a threat, as prices could be driven down.

- **Limited Liquidity** The wireless companies' stocks are less liquid than those of the fixed-line firms, given their smaller market cap and similar float. Telesp Celular, Tele Sudeste Celular, and Iusacell are the most liquid, with daily trading volumes of only \$3.5 million, \$2.3 million, and \$1.1 million, respectively.